IN THE CLAIMS

The pending claims read as follows:

Listing of Claims

1. (Previously Presented) An ultrasonic probe comprising:

a piezoelectric element for transmitting and receiving ultrasonic waves, said piezoelectric element having a ground electrode and a first signal electrode on both surfaces thereof respectively;

a second signal electrode electrically connected to said first signal electrode;

a backing load member placed on a rear surface of said piezoelectric element; and

a heat conduction material which is placed inside said backing load member and which includes a thermal conductivity greater than a thermal conductivity of said backing load member, said heat conduction material being provided separately from said second signal electrode.

2. (Previously Presented) An ultrasonic probe comprising:

a plurality of piezoelectric elements, which are arrayed in one direction, for transmitting and receiving ultrasonic waves, each of said piezoelectric elements having a ground electrode and a first signal electrode on both surfaces respectively;

a plurality of second signal electrodes each of which is electrically connected to a respective one of said first signal electrodes;

a backing load member placed on rear surfaces of said plurality of piezoelectric elements; and

one or more sheet-shaped heat conduction materials which are placed in parallel along an array direction of said piezoelectric elements and a depth direction inside said backing load member and whose thermal conductivities are greater than a thermal conductivity of said backing load member, said heat conduction materials being provided separately from said second signal electrodes.

3. (Withdrawn) The ultrasonic probe according to claim 1, characterized in that an end portion of said piezoelectric element side of said heat conduction material has the shape inclined to a surface of said backing load member side of said piezoelectric element.

4. (Withdrawn) The ultrasonic probe according to claim 3, wherein an angle between an inclination plane of the end portion on said piezoelectric element side of said heat conduction material and a direction vertical to the rear side of said piezoelectric element is 40 degrees or less or an angle where a critical angle of the ultrasonic waves is subtracted from 90 degrees.

5. (Previously Presented) The ultrasonic probe according to claim 1, further comprising a heat radiating block which is connected to said heat conduction material and whose thermal conductivity is greater than the thermal conductivity of said backing load member.

6. (Withdrawn) The ultrasonic probe according to claim 5, wherein said heat radiating block is placed on the rear surface of said backing load member and wherein said heat

conduction material is further placed between said heat radiating block and said backing load member.

7. (Withdrawn) An ultrasonic probe including:

a plurality of piezoelectric elements which are divided by division grooves in one direction and transmit and receive ultrasonic waves;

a backing load member placed on rear surfaces of said plurality of piezoelectric elements; and

block-shaped heat conduction materials which are placed on a rear surface of said backing load member and are greater than a thermal conductivity of said backing load member,

wherein said division grooves are formed on said backing load member at depths where they do not reach said heat conduction materials.

8. (Withdrawn) An ultrasonic probe including:

a plurality of piezoelectric elements which are divided by division grooves in one direction and transmit and receive ultrasonic waves;

a backing load member placed on rear surfaces of said plurality of piezoelectric elements; and

block-shaped heat conduction materials which are placed on a rear surface of said backing load member and are greater than a thermal conductivity of said backing load member,

wherein said division grooves are formed at depths where they reach said heat conduction materials and wherein said backing load member is formed on a concave and convex surface formed on surfaces of said heat conduction materials through said division grooves.

9. (Previously Presented) The ultrasonic probe according to claim 1, wherein as said heat conduction material, any material of PGS graphite sheet with high degree of orientation where polymeric film is graphitized, graphite, carbon nano-tube, aluminum nitride, boron nitride, silicon carbide, beryllium oxide, copper and aluminum is used.

10. (Withdrawn) The ultrasonic probe according to claim 2 characterized in that an end portion of said piezoelectric element side of said heat conduction material has the shape inclined to a surface of said backing load member side of said piezoelectric element.

11. (Withdrawn) The ultrasonic probe according to claim 7, wherein as said heat conduction material, any material of PGS graphite sheet with high degree of orientation where polymeric film is graphitized, graphite, carbon nano-tube, aluminum nitride, boron nitride, silicon carbide, beryllium oxide, copper and aluminum is used.

12. (Withdrawn) The ultrasonic probe according to claim 8, wherein as said heat conduction material, any material of PGS graphite sheet with high degree of orientation where polymeric film is graphitized, graphite, carbon nano-tube, aluminum nitride, boron nitride, silicon carbide, beryllium oxide, copper and aluminum is used.

13. (Previously Presented) The ultrasonic probe according to claim 2, wherein as said heat conduction material, any material of PGS graphite sheet with high degree of orientation where polymeric film is graphitized, graphite, carbon nano-tube, aluminum nitride, boron nitride, silicon carbide, beryllium oxide, copper and aluminum is used.